



Measuring Students' Readiness for the College Application Process: A Survey Development and Validation Study

Citation

Shen, Lisa Utzinger. 2017. Measuring Students' Readiness for the College Application Process: A Survey Development and Validation Study. Qualifying Paper, Harvard Graduate School of Education.

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Measuring Students' Readiness for the College Application Process:
A Survey Development and Validation Study

Qualifying Paper

Submitted by
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February 2016

Acknowledgments

Thank you, first and foremost, to my faculty committee. Mandy Savitz-Romer, Hunter Gehlbach, and Julie Reuben have provided generous and thoughtful feedback, guidance, and support throughout the entire QPP/QP process. They have been unfailingly kind and patient with me as I confronted multiple challenges, giving me the *instrumental tools* necessary to move forward towards my goals.

I am also grateful to my colleagues at HGSE—Amy Cheung, Elisabeth Hahn, Courtney Pollack, and Adrienne Mundy-Shephard—who, throughout this process, took the time to read, listen, and provide helpful advice and wisdom on various parts of this research project and paper. Elisabeth has been a wonderful thinking and writing partner; Amy and Adrienne assisted me with their scale development knowledge and expertise; Adrienne provided critical help with data collection; and Courtney gave me the tools and the confidence to learn confirmatory factor analysis. Many thanks also to HGSE alumna Debbie Andelman Klein, who provided invaluable assistance on this project in more ways than I can count, and continues to be one of my biggest cheerleaders.

I was extremely humbled by the time and expertise provided by the fourteen academic and practitioner experts who reviewed my scale and improved it with their constructive feedback. Lastly, I would like to thank the counselors, administrators, teachers, and students who participated in this study. They warmly welcomed me into their offices and classrooms, taking time out of their busy days to answer my questions and share their thoughts and experiences with me. In particular, I am deeply indebted to one guidance counselor who shepherded this project through from start to finish. Without his enthusiastic support, this project would not have been possible.

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Introduction

In preparing students for college, high schools serve a dual purpose. They are responsible for providing both a strong academic foundation and the information and support needed to navigate the college application process (Bowen, Chingos, & McPherson, 2009). Ample tools exist to measure and assess students' level of academic preparation for college, including grades and standardized test scores. However, school administrators and staff—notably high school counselors—have few ways to determine their students' readiness to engage in an increasingly complex college application process.

Without accurate assessment tools, school agents can make assumptions about how familiar students are with basic information about college, and thus the level and frequency of college counseling needed by individual students (McDonough, 1997; McDonough, 2005). For instance, since information about college is available online and through school-sanctioned events, such as “college night,” counselors assume that all students have the same opportunities to make informed decisions about planning for college (Bonous-Hammarth & Allen, 2005) and that any informational gaps will be filled by parents or other family members (McDonough, 1997). In reality, parents without college degrees are less able to provide their children with the strategic college planning advice proffered by college educated parents (Cabrera & La Nasa, 2000; Ceja, 2000; Choy et al., 2000; Noeth & Wimberly, 2002). Meanwhile, many high schools structure their postsecondary advising around the assumption that students are accessing college information and building college-going aspirations in the years leading up to high school. This leaves a lot to chance for first generation college students and immigrant students,

whose parents tend to be more hands-off in the college application process (McDonough, 1997).

Applying to college and securing financial aid are daunting tasks for any high school student, but especially those who are low-income or first-generation (Corwin & Tierney, 2007; Perna & Steele, 2011). Faced with large caseloads and competing demands on their time, school counselors in urban school settings simply do not have the bandwidth to accurately assess students' college application readiness on an individual basis. In particular, students from diverse social backgrounds navigate the college application process very differently, and these disparities contribute to inequalities in who attends and graduates from college (Holland, 2013). This Qualifying Paper (QP) is predicated on the belief that school counselors need better and more individualized assessment tools to understand what students currently know about the college application process in order to successfully guide them towards academically and financially appropriate postsecondary opportunities.

In this QP, I aimed to address the lack of individualized assessment tools available to counselors by creating a scale that measures students' readiness to engage in the college application process. By providing real time information about individual students' college application readiness, I hope this tool will enable counselors to better differentiate their guidance and support. Through a pilot study, I developed a survey instrument and measured its validity and reliability. In the next sections I provide the background and context for the study by reviewing the literature on students' access to college-related information and the college application process. I also introduce similar scales currently in use and describe their limitations. This is followed by the specific

research questions that guided my pilot study. Next, I present my research design, where I describe the scale development process, my research site, my data collection procedures, and my data-analytic plan. I then present my results and discuss the challenges and limitations of this pilot study. I conclude by offering potential implications of this study and next steps for future research. By piloting and evaluating this type of assessment, I hope that this research will assist school counselors, administrators, and policymakers to improve college counseling and information dissemination strategies. These types of improvements are needed if we want to strengthen students' pathways into and through college, especially for traditionally underrepresented students who are most likely to face major obstacles during this process.

Background and Context

Although college enrollment and completion rates have increased over the last twenty years, large gaps persist across demographic groups, with the gaps between white students and underrepresented minority students as well as high- and low-income students most worrisome (Baum, Ma, & Payea, 2013). For example, from 2002 to 2012, the gap between white and black males, ages of 25-29, with at least a bachelor's degree grew from 13 percentage points to 19 percentage points, with 16% and 35% of Black and white males, respectively, completing a 4-year degree in 2012 (Baum, Ma, & Payea, 2013). Meanwhile, between the 1960 birth cohort and the 1980 birth cohort, college completion rates increased for low-income students by only 4 percentage points, from 5% to 9%, compared to an 18 percentage point increase for high-income students, from 36%

to 54% percent (Bailey & Dynarski, 2011). These racial and socioeconomic gaps are the result of many different factors, including a lack of academic preparation in high school (Venezia, Kirst, & Antonio, 2003). However, even academically successful low-income and minority students struggle with college completion (Education Trust, 2014). This suggests that access to information about college and the application process—including financial aid—are critical barriers to successful college completion. Indeed, several studies have demonstrated that access to information about college and college counseling increases students' chances of enrolling in and completing higher education (Berkner & Chavez, 1997; Hossler, Schmit, & Vesper, 1999; King, 2004; Perna, 2004; Plank & Jordan, 2001).

Unfortunately, access to information about the college application process is in short supply among the general population of students in the U.S. and even fewer students have a clear understanding of financial aid (Cunningham, Erisman, & Looney, 2007; De La Rosa, 2006; Grodsky & Jones, 2004; Horn, Chen, & Chapman, 2003; Perna, 2004; Venegas, 2006). College knowledge, the information and competencies students need to succeed both during the application process and once they arrive on campus (Conley, 2007), is especially lacking in traditionally “at-risk” populations, including Black and Latino students (Grodsky & Jones, 2004; Horn et al., 2003), low-income students (De La Rosa, 2006), first generation college students (Brouder, 1987; Cunningham et al., 2007; Hossler, Schmit, & Bouse, 1991), and community college-bound students (Goff, Patino, & Jackson, 2004). Accordingly, only 35% of Black students and 29% of Latino students between the ages of 18-24 were enrolled in college compared with 46% of their white peers (Kim, 2011). Meanwhile, low-income students,

those from the bottom income quartile, are 50% less likely to be enrolled in college compared with their more affluent peers in the top income quartile; low-income students are also six times less likely than high-income students to earn a bachelor's degree by age 25 (Bailey & Dynarski, 2011).

In order to improve the college completion rates of underrepresented students, high schools must not only encourage and support their college enrollment, they must also ensure that these students have access to college planning information. This information is critical if we expect students to leave high school with the knowledge needed to both enroll in college and persist to graduation (Achieve, Inc., 2011). However, the focus of this pilot study is on measuring knowledge of the first phase—college enrollment. Conley (2008)'s first dimension of college knowledge, which is knowledge about the college application process, guides this study's aims and design. Knowledge about the college application process includes information about admission criteria and deadlines, institutional acceptance and enrollment processes, and the ability to pay for college through scholarships, loans, and/or personal savings. In particular, it is essential for counselors to be able to identify the strengths and deficits of individual students' knowledge about this process, so that they can make the best use of their limited time providing personalized advice to students.

In the first two years of high school, students primarily obtain information about applying to college from their friends and family, expanding their information network to include school personnel and higher education institutions in the latter two years (Hossler, Schmit, & Vesper, 1999). This influence and support of friends, family, teachers, and counselors play an important role in students' postsecondary decision-

making (McClafferty & McDonough, 2000). In examining the college application knowledge of 9th and 11th grade students, Bell, Rowan-Kenyon, and Perna (2009) found that family members were the primary source of information for most students, followed by the Internet, and the high school. Although the high school was ranked third, students found that their counselors had the most comprehensive knowledge about the application process and financial aid. The 11th graders, however, when asked what their school could do to help them achieve their postsecondary goals, were desirous of more personalized and active forms of information dissemination. The students reported being overwhelmed by information that was difficult to self-interpret. They frequently mentioned a need for increased individualized counseling that would provide them with more helpful, easily understood knowledge and resources. In the digital age of 24/7 access to information, simply posting announcements at school was insufficient, especially given the complexity of the tasks involved in applying to college (Bell, Rowan-Kenyon, & Perna, 2009). As the sources of college application knowledge shift—with counselors deemed the most reliable source—it is imperative that counselors have the ability to accurately identify what their students currently know about the application process.

The College Application Process

The college application process is one marred by uncertainty and confusion. Students are confronted by a series of high stakes decisions, the results of which may not manifest themselves for several months or even years. Throughout the process, students must quickly learn the codes of conduct and specialized language of college admissions, including esoteric terms and acronyms that can vary across institutions. For middle- and

upper-income students with college-educated parents, many of these terms may already be familiar. Meanwhile, low-income students and immigrant students are expected to quickly pick up this new language and make sense of it on their own (Galotti & Mark, 1994; Litten, 1982; Ellwood & Kane, 2000).

Despite awareness that their students may be playing the same college admissions game on very uneven playing fields, school counselors will often lay out a one-size-fits-all path to college admissions that they expect all students to follow with minimal support (Holland, 2013). This is due, in large part, to the fact that most school counselors are overwhelmed by heavy caseloads, with a national student-to-counselor ratio of 471:1 in 2010-2011 (ASCA). They are also tasked with a multitude of responsibilities, in addition to providing college counseling support. These range from assisting with course selection and scheduling, to mental health counseling, to negotiating conflicts between students and teachers (McDonough, 2005; McKillip, et al. 2012; Rosenbaum, Miller, & Krei, 1996). Thus, it is not surprising that counselors are unable to provide as much individualized college application counseling as they would like.

Nevertheless, students need more personalized counseling to parse through all the information—and misinformation—they consume throughout the college application process. In 2013, Holland identified low-income students engaging in a “haphazard” college search process, leading to poor decision-making in selecting a college. When high schools rely too much on adolescents to guide themselves through this process, students are left to their own devices to make academically and financially appropriate college choices. In other words, by simply making the information accessible, school counselors are failing to provide the instrumental knowledge needed to interpret it

(Venegas, 2006). Through targeted one-on-one counseling, school counselors can help students better understand the college application process, explaining academic requirements and the different postsecondary options available to them, answering questions about financial aid, and preparing students for the culture shock they may experience transitioning from high school to college (Bell, Rowan-Kenyon, & Perna, 2006; Conley, 2008; Hooker & Brand, 2010; Roderick, Nagaoka, & Coca, 2009).

To assist school counselors in providing more personalized college counseling, I aimed in this pilot study to develop a scale that allows them to assess their students' preparation to apply to college. This tool could be used to identify gaps in college application knowledge both for individual students and across cohorts. Once the most pressing information gaps are identified, counselors can then plan more targeted counseling strategies aimed at demystifying a very complex college application process.

Measuring College Knowledge and Readiness

There are few survey instruments used to measure college knowledge and even fewer that demonstrate evidence of validity and reliability. Those that do exist are largely designed to help universities assess factors such as motivation, academic-related skills, and social engagement found to predict college academic performance (Le et al., 2005), retention (Gore, Brown, Leuwerke, & Metz, 2008), and community college academic behaviors (Farr et al., 2012) once students arrive on campus. Furthermore, there are no preexisting college application readiness scales. Since college application readiness is an aspect of college knowledge that merits closer attention from both researchers and practitioners, I decided to develop a survey instrument to assess and measure this important construct. By developing and piloting a scale that measures high

school students' readiness to engage in the college application process, I aimed to provide school counselors with a new tool to identify students who need additional information and targeted counseling.

Research Questions

After developing the College Application Readiness Scale (CARS) using Gehlbach and Brinkworth (2011)'s 6-step survey scale design process, I assessed its validity and reliability through a pilot study that addressed the following research questions:

1. Does the CARS exhibit content validity?
2. Does the CARS demonstrate high internal consistency?
3. Does the CARS exhibit construct validity?

Research Design

Scale Development Process

In order to design a survey scale that adhered to the best practices in survey development, I used Gehlbach and Brinkworth (2011)'s aforementioned 6-step process. This process's approach is highly collaborative, involving multiple iterative procedures aimed at improving the validity and efficiency of survey scale design in the social sciences. It clearly delineates the best way to scaffold knowledge from the academic literature with input from prospective respondents and experts in the field in order to develop the most effective survey instrument. Through a literature review; individual interviews with school counselors and focus group interviews with students; feedback solicited from academic and practitioner experts on scale items; and cognitive pre-testing

(a think-aloud-while-coming-up-with-the-answer interview) with students representative of the sample population of interest, I sought to develop a robust survey scale that would accurately and efficiently measure students' college application readiness. I then collected evidence of the scale's validity through pilot testing ($n=203$).

Research Site

This pilot study took place at Russell High School (RHS),¹ a large, racially and socio-economically diverse, urban high school in the Northeast. Its student body of approximately 1,700 students is 36% African American,² 11% Asian, 13% Hispanic, 37% white, and 3% multi-racial or "other race" students; 46% of its students are eligible for free or reduced lunch. The school has a relatively large population of students who immigrated to the U.S.; 6% of the student body is categorized as English Language Learners and 28% of students speak English as a second language. In 2013, 77% of graduates attended college after high school; of these, 75% attended 4-year colleges and 25% attended 2-year colleges.

I decided to pilot the CARS at RHS because of its diverse student population, including large percentages of underrepresented minority, low-income, and first generation college students who are traditionally seen as having low college knowledge (Bell et al., 2009). However, unlike other large urban high schools where school counselors often have caseloads of over 1,000 students (De La Rosa, 2006), RHS has a relatively small student-to-counselor ratio of approximately 200 to 1. I partnered with a school counselor at RHS who was very motivated to use this scale and the pilot data it

¹ A pseudonym.

² The "African American" population includes a large population of Black, African, and Afro-Caribbean

² The "African American" population includes a large population of Black, African, and Afro-Caribbean immigrant students.

collected. Through this study, he hoped to learn more about his students' college application readiness in order to inform and improve his practice. He facilitated all aspects of data collection, enabling me to recruit diverse student samples in terms of race, free/reduced lunch status, and language proficiency for the student focus group interviews, cognitive pre-testing, and pilot testing.

Data Collection Procedures

Counselor Interviews

I interviewed eight out of the nine school counselors at RHS as well as five other professionals who work as college counselors in charter school, non-profit, and for-profit settings. I decided to interview both counselors inside and outside of RHS to ensure that the RHS school counselors' conception of college application readiness was not unique to particular qualities of the school or students enrolled. While I wanted the scale to be used to inform practice at RHS, I also hoped it would eventually be used by guidance and college counselors in many different settings. As displayed in Table 1, this group of counselors was largely white (77%) and mostly female (62%).

Student Focus Group Interviews

I worked with school counselors, teachers, and administrators to set up the focus groups and to obtain signed parent consent for student participation. I conducted four focus groups with students either during their lunch period or after school. As an incentive for participation, I served pizza during the focus groups and paid each participant either \$5 cash or a \$5 gift card (depending on the preference of their teacher). As presented in Table 2, student participants ranged in age from 14 to 18, with the majority either 17 (29%) or 18 (43%). Most of the participants were female (75%). In

this sample, Black students (79%) were overrepresented. However, the Black students interviewed were a diverse group, including students who spoke Amharic, Arabic, English, and Haitian-Creole at home. Almost all of the participants qualified for free or reduced lunch (88%) and 46% will be the first person in their family to attend college.

Expert Validation

Fourteen professionals with expertise in the college application process, Gehlbach and Brinkworth (2011)'s scale design process, and/or the RHS student population, volunteered their time and expertise to provide me with critical feedback on the CARS. Six were academic content experts and six were practitioner college application experts. Two were Harvard Graduate School of Education (HGSE) doctoral students with expertise in scale design, including one who did her dissertation research at RHS and was very familiar with its student body. An additional HGSE faculty member who has experience conducting research at RHS also completed the expert validation process. The professional and demographic characteristics of the experts are listed in Table 3.

Cognitive Pre-Testing Interviews

Ten students participated in the cognitive pre-testing interviews. As with the focus group interviews, students were offered \$5 for their participation. I found that with both the focus group and cognitive pre-testing group, the cash offer motivated the students to obtain their parents' written consent to participate in this study. Students were interviewed one-on-one either during class or after school. I sought out a sample that was more representative of the student body than the focus group samples. There was an even number of Black and White students, although this sample continued to be mostly female and with far fewer students eligible for free or reduced lunch (30%). Also, only two of

the ten students would be considered first generation college students. Demographic characteristics for this group are shown in Table 4.

Pilot Testing

Pilot testing occurred during homeroom, a 20-minute period at the start of each school day. Students were instructed to complete the survey anonymously, to promote honest and accurate responses. I administered the survey to two 9th grade homerooms ($n=36$), three 10th grade homerooms ($n=53$), and three 11th grade homerooms ($n=50$). I also administered the survey at a senior breakfast held before 12th graders rehearsed their graduation ceremony ($n=64$). While the homerooms are determined through random assignment, the students at the senior breakfast were a subset of the population of 12th graders who decided to attend the breakfast, which was optional. My total pilot-testing sample included 203 students whose demographic characteristics are presented in Table 5.

Data Analytic Plan

In order to answer my three research questions, I conducted my data analyses in three steps. First, I determined the content validity. Second, I assessed the College Application Readiness Scale for evidence of internal-consistency reliability. Lastly, I assessed it for evidence of construct validity.

RQ1: Does the CARS exhibit content validity?

In order to establish content validity, I pursued a strategy that was both subjective and objective, using qualitative and quantitative means (McKenzie et al., 1999). First, I compared the literature's definition of college application readiness with the way students and counselors conceptualized it during their interviews. These are Steps 1 and 2 in

Gehlbach and Brinkworth (2011)'s 6-step process. This led to the development of a synthesized list of college application readiness indicators, followed by an initial list of scale items. After the items were refined, I then consulted with academic and practitioner experts in the field of college application readiness, through a process of expert validation (Gehlbach & Brinkworth, 2011).

The expert validation process entailed asking the experts to rate each scale item's clarity and relevance on a five-point scale, ranging from a score of 1 (*not at all understandable and not at all relevant*) to a score of 5 (*extremely understandable and extremely relevant*). It also solicited feedback on each item to identify areas of improvement and asked experts to identify any omitted items. By measuring where experts' opinions of items were consistent or inconsistent with one another, I was able to establish the inter-rater reliability among them. Summing the responses for each item and dividing that number by the number of experts obtained the averages of the clarity and relevance scores. I decided that those items with low expert ratings—scores of less than 3.5—would be removed from the scale. These steps were taken and adjustments were made before I moved on to the pilot-testing phase.

RQ2: Does the CARS demonstrate high internal consistency?

I estimated the internal consistency reliability by first examining the bivariate correlations between the items on the CARS, anticipating that each individual item would correlate highly with the remaining items. Next, I assessed the factor structure of the scale by conducting a confirmatory factor analysis (CFA). This procedure was used to test whether the construct being measured had a uni-dimensional factor structure. That is, I was testing to see if there was one underlying latent factor—college application

readiness—driving the responses on these items, or if there was more than one factor.

Lastly, I used Cronbach's coefficient alpha to estimate the internal consistency reliability of the scale. Cronbach's coefficient alpha tells me how correlated the items are to each other as a group. Alpha can take on values from 0.0 to 1.0. According to DeVellis (2003), below .60 is "unacceptable"; between .60 and .65 is "undesirable"; between .65 and .70 is "minimally acceptable"; between .70 and .80 is "respectable"; and between .80 and .80 is "very good" (p. 95-96). Items that were not highly correlated with each other as well as items that reduced the estimated value of Cronbach's alpha were removed.

RQ3: Does the CARS exhibit construct validity?

In order to establish evidence of construct validity, I tested bivariate correlations between the CARS and students' self-reported grade level, grade point average (GPA), parents' level of educational attainment, and absentee rate. I hypothesized that my scale would correlate highly with students' grade level, GPA, and parents' level of education (0.6 to 0.9); that 11th and 12th grade students would demonstrate a higher level of readiness for the college application process than 9th and 10th grade students; that students who had high self-reported GPAs would also have high levels of college application readiness; and that students with highly educated parents would also have high levels of college application readiness, demonstrating convergent validity. I anticipated a low to moderate correlation between my scale and students' absentee rate (0.3 to 0.5); that students who had a high level of college application readiness likely had a low absentee rate, demonstrating discriminant validity. Lastly, I compared mean differences in college application readiness between several demographic groups using the final version of the CARS. Specifically, I looked at students' college application readiness by gender, race,

socioeconomic status, and parent education level. Since large gaps in college enrollment and completion rates exist across demographic groups, I expected similar racial and socio-economic gaps to present themselves in college application readiness.

Results

RQ1: Does the CARS exhibit content validity?

From the literature, I determined that college and career aspirations, individual-institutional fit perspectives, student and parent knowledge of admissions requirements, student and parent knowledge of college costs and financial aid as well as available family resources to pay for college were all important components of college application readiness. Also key to this construct were students' formal and informal communication networks, such as relationships with school counselors, college counselors, family members, and peers. Next, I asked school and college counselors open-ended questions about their conceptualization of college application readiness. For instance, I asked counselors "how well prepared do you think your students are to apply to college?" and followed up with the probes, "why?," "why not?," and "what does someone who is well prepared look like to you?" I then asked students related questions, such as, "when you think about the college application process, what are you most worried about?" and "what is most confusing to you about the college application process?" If counselors and students did not touch upon some of the key aforementioned factors identified in the literature, I would probe directly about these aspects of college application readiness.

By comparing the definitions of college application readiness from the literature with how it was understood by counselors and students, I was next able to devise a

synthesized list of college application readiness indicators. These indicators are displayed in Table 6 in the appendix. From the list of indicators, I then began to develop items and corresponding response anchors. After I spent some time revising the items, I next consulted with academic and practitioner experts in the field of college application readiness, through a process of expert validation (Gehlbach & Brinkworth, 2011). This process involved providing the experts with my definition of college application readiness and then asking them to assess each scale item's clarity and relevance on a five-point scale, ranging from a score of 1 (*not at all understandable* and *not at all relevant*) to a score of 5 (*extremely understandable* and *extremely relevant*). I also asked experts for feedback and suggestions for improvement for each individual item. At the end of the expert evaluation survey, I asked participants to reflect on the entire scale and identify any missing items (Rubio et al., 2003).

In order to determine the clarity and relevance scores across the experts, I established an inter-rater reliability by summing the responses for each item and dividing that number by the number of experts. Those items with low expert ratings—scores lower than 4.00 or *quite understandable/quite relevant*—were either revised or removed. For example, the items “How much have you engaged in career exploration activities?” had an average clarity score of 3.55 and “At this point, how firmly decided are you on your likely career path?” had an average clarity score of 3.77. These items were removed. “How much student loan debt would you be willing to take on for your first year of college?” had a low average relevance score of 3.57. Since the literature indicates that debt awareness and aversion are important pieces of college application readiness (Bell, Rowen-Kenyon-Perna, 2009; Ekstrom, 1991; Flint, 1997), this item was rephrased

as, "How important is the average student loan debt of a school in deciding where to apply to college?"

Overall, the experts' feedback was generally positive; 81% of the items were rated either *quite relevant* or *extremely relevant*. Only four items had an average relevance score of less than 4.00. As these were all above 3.50, the expert reviewers considered them at least *somewhat relevant*. Based on the experts' ratings and written comments, five items were removed and/or replaced on the scale. For instance, "How much money have your parent(s)/guardian(s) saved for your college tuition and expenses?" received an average relevance score of 3.69. This item was removed because some experts felt that only affluent students would know the answer to this question and that it would make some students feel self-conscious or uncomfortable, diminishing their motivation to complete the survey.

Experts also identified important aspects of the construct that they felt were missing from the scale. For example, students' confidence in approaching this process was deemed essential as well as the availability of sibling or other close relative support as an important piece of college application social capital. New items were added to address these components.

Subsequently, based on the high relevancy averages and the adjustments I made to the scale resulting from the experts' feedback, I concluded that the CARS did exhibit high content validity and was ready for pilot testing.

RQ2: Does the CARS demonstrate high internal consistency?

Through my scale development process, I identified four important general domains of college application readiness: *college aspirations*, *college fit knowledge*,

college cost and family resources awareness, and *college application social capital*. I developed 3-4 items for each domain to create a scale made up of four sub-scales and hypothesized that it represented a single unitary construct of college application readiness. Table 7 shows the Pearson correlations of the sub-scale composites. The four composites have low but positive correlations, with the strongest correlation between *college aspirations* and *college costs and family resources awareness* ($r=0.438, p<.001$). This indicates that participants with a low degree of college aspirations also had a low awareness of the cost of college and the resources available to them to pay for college from their family.

Per my data analytic plan, I proceeded with the confirmatory factor analysis next to test the hypothesis that the CARS was uni-dimensional, that there was a single latent factor behind it that was driving the observed behavior in the population. I also wanted to make sure that the items really belonged in the CARS and to remove the ones that did not belong. The parameter estimates and goodness-of-fit statistics for the hypothesized model are displayed in Table 8. In the hypothesized model, the goodness-of-fit statistics indicate that we can reject the null hypothesis ($p<.001$); I was unable to determine that the 15 indicators that comprised the CARS had a uni-dimensional factor structure.

Since I attempted, and failed, to identify a single factor of college application readiness through CFA, I proceeded by going through the scale item-by-item, eliminating the items that were worded ambiguously or that I felt were not strong measures of college application readiness. For instance, under the domain of *college fit knowledge*, I eliminated three items that measured how important students viewed the acceptance rate (*AccRate*), graduation rate (*GradRate*), and average student debt rate (*DebtRate*),

respectively, of a college in deciding where to apply. I decided that these were ambiguously worded items, since both students with high and low college application readiness may be likely to answer “not at all important” to these three items. For example, an affluent student with a robust college savings account and high college application readiness may be as likely to find the average student debt rate “not at all important” as a low-income student with low college application readiness and little understanding of the implications of student loan debt. I also eliminated an item asking students to identify how sure they are about the type of career they would like to have in the future (*CarSure*). Although career readiness and college application readiness should be highly correlated, students can have a high degree of college application readiness despite uncertainty about their future career paths.

With the remaining eleven items, I performed another CFA. In Table 9, I present the parameter estimates and goodness-of-fit statistics for the hypothesized and reduced models. In the hypothesized model, I included the remaining eleven items. The goodness of fit statistics reveal that the hypothesized model does not fit the data. The magnitude of the chi-squared statistic leads to a rejection of fit at the $p < 0.005$ level. I then dropped the items that had the lowest estimated factor loadings and the highest p -values ($> .05$), one at a time. I revisited each item, looking at its wording and relevancy to college application readiness, and confirmed that these were items that could be removed from the subscale without substantially affecting the theoretical meaning of the construct. I ended up with six items, which appeared to be a unitary construct: *AdHelp*, *AppSteps*, *CampType*, *CostTalk*, *FourYr*, and *ParPay*. According to CFA, the final reduced subscale meets the threshold for goodness of fit, and I cannot reject the null hypothesis

that the reduced factor model fits ($p=0.121$). Thus, this reduced model served as my final model; the underlying construct of college application readiness is responsible for driving participants' responses to *AdHelp*, *AppSteps*, *CampType*, *CostTalk*, *FourYr*, and *ParPay*. All estimated factor loadings are positive and different from zero. However, the construct exerts its strongest influence over *AdHelp*, with an estimated factor loading of 2.212 and its weakest influence over *FourYr*, with an estimated factor loading of 1.000.

Next, I measured the internal consistency reliability of the CARS sub-scales using the estimate of Cronbach's coefficient alpha. Cronbach's coefficient alpha tells me how correlated the items are to each other as a group. According to DeVillis (2003), below .60 is considered "unacceptable"; between .60 and .65, "undesirable"; between .65 and .70, "minimally acceptable"; between .70 and .80, "respectable"; and between .80 and .80, "very good" (p. 95-96). The final reduced composite as a whole had a Cronbach's coefficient alpha reliability of 0.655, which DeVillis would describe as "minimally acceptable." Taken together with the CFA, these findings indicate that the six items in the reduced model, *AdHelp*, *AppSteps*, *CampType*, *CostTalk*, *FourYr*, and *ParPay*, demonstrate a low internal-reliability consistency. The descriptive statistics and question text for these six items are shown in Table 10.

RQ3: Does the CARS exhibit construct validity?

To assess construct validity, I tested bivariate correlations between the final reduced CARS subscale composite (*FinalScale*) and students' self-reported grade level (*Grade*), grade point average (*GPA*), absentee rate (*Absent*), and parents' level of educational attainment (*ParentEdu*). These correlations are displayed in Table 11. I originally hypothesized that the CARS would correlate highly (0.6 to 0.9) with students'

grade level, GPA, and parents' level of education, demonstrating convergent validity.

Unfortunately, none of the correlations between these variables and the final reduced CARS subscale are highly correlated. There were two statistically significant correlations at the $p < .05$ level; the correlations between *FinalScale* and *Grade* ($r = 0.241$, $p < .05$) and *FinalScale* and *GPA* ($r = 0.263$, $p < .05$) are both small and positive. This implies that students in 11th and 12th grade demonstrate a slightly higher level of college application readiness than 9th and 10th grade students and students who had higher self-reported GPAs also had a small gain in college application readiness than their peers with lower self-reported GPAs. Although the correlation between *FinalScale* and *ParentEdu* was small and not statistically significant, the positive and statistically significant correlations between *FinalScale* and *Grade* and *FinalScale* and *GPA* indicate that there is a small level of convergent validity.

Prior to data analysis, I also anticipated a low to moderate correlation between the CARS and students' absentee rate (0.3 to 0.5); that students who have a high level of college application readiness likely have a low absentee rate. While the correlation is lower than expected, this turned out to be the case. The correlation between *FinalScale* and *Absent* ($r = -0.197$, $p < .10$) is small and negative. This suggests that students with more college application readiness also had slightly lower levels of self-reported absenteeism, demonstrating evidence of discriminant validity for *FinalScale*.

Finally, I compared mean differences in college application readiness between several demographic groups using the final version of the CARS. As shown in Table 12, overall, students in my sample did not demonstrate high college application readiness; most students averaged below 3.00 across survey items that were measured on a 5-point

scale. Specifically, I looked at students' college application readiness by gender, race, socioeconomic status (measured by free/reduced lunch eligibility), and parents' level of educational attainment.

According to the research literature, discussed above, gaps in college enrollment and completion, particularly among white and underrepresented minority students as well as high- and low-income students continue to persist. Therefore, I expected similar racial and income gaps in college application readiness to be present in my pilot study.

Surprisingly, this was not the case. Differences across racial groups in my sample were negligible, with multiracial students having the highest mean scores on the CARS (3.02), followed by Black students (2.98), white students (2.80), and Asian students (2.78).

Likewise, students eligible for free/reduced lunch (2.88) and ineligible (2.85) also had very similar mean scores on the CARS. There were also no meaningful differences by parent education level. Students with high school educated parents had a mean score of 3.12, which was higher than students whose parents have graduate school degrees (3.02).

The only interesting demographic difference in mean CARS scores was between females (3.11) and males (2.66), which was statistically significant in a two-tailed t-test at the $p < .05$ level. This finding is consistent with research indicating that women are now enrolling in and completing higher education at greater rates than men in the U.S. For instance, according to a Pew Research Center analysis of U.S. Census Bureau data, in 2012, 70% of women enrolled in college immediately after high school compared with 61% of men (Lopez & Gonzalez-Barrera, 2014). The Pew Research Center found this college enrollment gap between women and men present among Hispanic (75% vs. 62%),

Black (69% vs. 57%), and white (72% vs. 62%) students. Yet for Asian students, women and men enrolled in college at roughly the same rates (86% vs. 83%).

Given these national trends and the statistically significant mean gender differences on the CARS, I next compared mean gender differences by race, free/reduced lunch eligibility, and parent education. With the exception of Asian students, females generally had higher mean scores on the CARS than males across the board. For instance, similar to the Pew Research Center study citing college enrollment figures, Asian males (2.77) and females (2.78) demonstrated about the same level of college application readiness. Meanwhile, as displayed in Table 13, there were statistically significant mean differences between Black males (2.69) and females (3.46); white males (2.56) and females (3.09); and Hispanic males (2.13) and females (3.17). There were also statistically significant mean gender gap differences by free/reduced lunch eligibility; females demonstrated higher readiness than males among both the eligible and ineligible groups. The statistically significant gap favoring females was also present among students with similarly educated parents. These demographic parallels between national college enrollment data and the mean gender differences in my pilot study provide further evidence of convergent validity for *FinalScale*.

Discussion

The goals of this study were to create a survey scale measuring students' college application readiness through a rigorous 6-step scale design process and to assess its validity and reliability. Although the expert validation process demonstrated evidence of construct validity, the results of my CFA indicate that college application readiness is not

a uni-dimensional concept. In other words, I was unable to identify a single factor of college application readiness through CFA, and hope that future analyses of a revised CARS will help me to determine the discrete constructs that make up this concept. For this current study, however, I used both a theory-driven approach and a data-analytic driven approach and eliminated several items from the pilot tested CARS in order to arrive at a final scale that represented a unitary construct according to CFA. Using an estimate of Cronbach's alpha coefficient to determine reliability, this final scale is considered "minimally acceptable" (DeVillis, 2003, p. 95).

Through a comparison of the final scale with students' self-reported grade level, GPA, absentee rate, and parent education level, I found small, positive, statistically significant correlations between the final scale and grade level ($r=0.241, p<.05$) and the final scale and GPA ($r=0.263, p<.05$). I also found a small, negative, statistically significant correlation between the final scale and students' absentee rate ($r=-0.197, p<.10$). Although I hypothesized that I would find a high correlation between grade level and GPA (as well as parent education level) and the CARS, and a low to moderate correlation between absentee rate and the CARS, the small, statistically significant correlations do signal that there is a small degree of convergent and discriminant validity, respectively. I therefore conclude that my analysis demonstrates that the final scale meets the minimum standards of validity and reliability as a measurement of a unitary factor of college application readiness.

Since I started with 15 items in the original CARS and ended up with only 6 items in the final scale, I closely examined the remaining items to see if there was a common thread running through them. I thought perhaps the final scale was measuring some

discrete sub-construct of college application readiness. This turned out not to be the case; the 6 remaining items were drawn from each of the four domains. Two fell under *college aspirations*, one fell under *college fit knowledge*, two fell under *college cost and family resources awareness*, and one fell under *college application social capital*. Other than the fact that they all measured college application readiness, the only commonalities I could detect in examining these 6 items were that they seemed better worded and less ambiguous than the 9 items that were discarded.

I turned my attention next to the items that were dropped, to see if there were any theoretically vital components that were now missing from the scale. During the expert validation process, several of the college counselors emphasized college fit as an important piece of college application readiness. I originally included college fit items pertaining to college size, location, and number of college tours taken. Expert reviewers suggested I include even more fit items, such as ones related to majors offered, activities offered, campus culture, geography, distance from home, racial diversity, religious affiliation, etc. The reviewers felt that one key indicator of college application readiness was how much thought students had put into identifying the factors that were most important to them in selecting a college or a set of colleges to apply to. As one reviewer commented, “application readiness to me means knowing where to apply first, thus the focus on fit even before [the] choice phase.” However, another expert reviewer pointed out that the college fit items I had in my earlier draft solicited information that could be easily obtained through other means, such as online match and fit tools. For instance, the school counselors at RHS use an online software program called Naviance,³ which

³ <http://www.naviance.com/college-and-career-readiness-platform/college-planning/super-match-college-search>

enables their students to select college search criteria and generate a list of colleges that may good matches for them.

Heeding the advice of the latter expert and in the interest of parsimony, I ended up including only four items related to *college fit knowledge*. I decided to ask students about the importance of a college's acceptance rate (*AccRate*), graduation rate (*GradRate*), average student debt rate (*DebtRate*), and type of college campus setting (*CampType*) in deciding where to apply. These are important factors related to fit that are I felt yielded information that was harder to obtain. However, during the CFA, I ended up dropping *AccRate*, *GradRate*, and *DebtRate*, and only keeping *CampType* in the reduced final model.

As Light, Singer, and Willett (1990) famously wrote, "you can't fix by analysis what you bungled by design." It turns out that a fair amount of "bungling" took place during the creation of this scale, and in particular during the final selection of the *college fit knowledge* domain items. In hindsight, it is clear that these items were written in a way that solicits very similar answers from students with vastly different levels of college application readiness. For instance, for students with high college application readiness, the graduation rate may not be very important because the highly selective colleges to which they are applying all have robust graduation rates. Meanwhile, for students with low college application readiness who are applying to less selective schools, the graduation rate may be difficult to find or students may not be aware that this is an important measure of student success at most four-year colleges. In sum, how important a school's acceptance rate, graduation rate, or debt rate in deciding where to apply may not be a good measure of college application readiness; student opinion on these topics

may be driven by factors, such as socio-economic status, that are not absolute proxies for college application readiness.

While I do think acceptance, graduation, and debt rates are important metrics for students to take into account when preparing their college applications, *why* they are or are not important to some students and not to others matters greatly. It may be that these types of questions are better asked through in-person interviews rather than surveys.

However, in future research, I will also try to figure out better ways of asking students how important acceptance, graduation, and debt rates are, in order to measure the latent indicator undergirding these metrics. If I can devise a strategy that asks these questions in a way that elicits the same response from people who are high on the latent indicator and the same response from people who are low on the latent indicator, that would be an ideal item to add to this scale. In the future, I will also consider creating a separate scale for each of the four domains: *college aspirations*, *college fit knowledge*, *college cost and family resources awareness*, and *college application social capital*. As I mentioned above, the expert reviewers were very enthusiastic about adding more college fit items. They gave me enough suggestions to create a separate *college fit knowledge* scale and this might be a worthwhile future pursuit. However, I would first have to thoroughly research the existing online college fit questionnaires so that I am able to contribute something of meaningful value to counselors.

I am also very interested in the possibly of creating a separate scale for *college application social capital*. Throughout the 6-step scale development process, it became clear to me that this is an incredibly important domain of college application readiness. During the CFA, in order to obtain my final reduced model of the CARS, I dropped items

that asked students how helpful their primary parent/guardian (*ParHelp*) or another close family member (*FamHelp*) will be in completing the college application process. Again, I realized post-hoc that these dropped items, *ParHelp* and *FamHelp*, were likely affected by measurement error. How helpful a student judges his parent/guardian or family member to be may or may not be objectively accurate when compared with the entire sample of students' level of family support. For example, an affluent student with highly educated parents may report that her parents are not at all helpful because they have decided to outsource their role in the process by hiring a private college counselor. This type of student has high college application social capital and therefore high college application readiness, but would score low on the CARS. In the future, I would like to be more thoughtful in developing items for a college application social capital scale that are less ambiguous and free of measurement error.

Regarding the general implications of this research, I learned through this pilot study that developing a reliable scale that shows evidence of validity is a long and difficult process. In particular, I found the expert validation process to be both logistically and intellectually challenging. Twenty out of the thirty-four experts I contacted never wrote me back or wrote back to decline my request for their participation in my study. Others took several weeks to respond, only responding after I sent a follow-up email a week or two later. I did not anticipate how long this process would take and it is something I will consider more fully when engaging in future scale development research. At an intellectual level, I found it challenging to synthesize and reconcile all of the expert feedback I received, especially the open-response written feedback. In the future, I would encourage all scale development researchers to work in teams or at the

minimum, in pairs. My scale development process would have benefited tremendously if I had a partner or two to help me make sense of all the expert feedback I received. With a second set of eyes, I would have been able to avoid some of the measurement error embedded in the wording of several of my items, thus increasing the number of items in the final reduced CFA model and possibly improving the Cronbach's coefficient alpha reliability to a more respectable level.

In terms of the overall length of the scale, all of the expert reviewers provided me with valid critiques and suggestions that pushed my thinking forward on the topic of college application readiness. But to incorporate all of the useful feedback I received, my scale would have doubled or even tripled in size. The piloted survey could not have been any longer than it was, given the risk of survey fatigue and the fact that students were only given 15 minutes during homeroom period to complete it. Some students, particularly English language learners, needed all the time allotted to finish. Lacking confidence in my own content knowledge on this subject, I attempted to incorporate as much expert feedback as possible while perhaps ignoring some important advice due to the constraints of space and time.

I was determined to keep the scale limited to approximately 20 items, including some items that were added by request of the school counselor and omitted from my analysis. I also included 14 additional items to collect demographic data. These items were needed to help analyze demographic patterns found within the survey data in my report of the results to the high school. I also needed demographic items to help establish evidence of construct validity, which I did by examining the bivariate correlations between the final reduced CARS subscale and students' grade level, GPA, parent's level

of education, and absentee rate. The addition of the demographic items made the survey over 30 questions long, which I learned after pilot testing was too long for high school students to complete during a 15-minute homeroom period.

Lastly, by looking at mean differences in the *FinalScale* across demographic groups, I was able to provide further evidence of construct validity for the CARS. I also found a clear gender gap in my sample, with females exhibiting greater college application readiness than their male counterparts. This was largely consistent across race, free/reduced lunch eligibility, and parent education level. It also supports national trends indicating that women are now outpacing men in college enrollment and completion. Given the small sample size of my pilot study, I would like to compare mean gender differences on the CARS using much larger samples in future research. While racial and income gaps in college application readiness, college enrollment, and college completion are still deeply concerning, this pilot study suggests that more research should be devoted to better understanding the gender gap. I am also curious as to why the gender gap exists between Black, Hispanic, and white students, both in my study and in U.S. Census data, but not among Asian students. Future qualitative research looking at the processes and mechanisms that account for gender differences within some racial groups but not others would be a fascinating and worthwhile pursuit.

Conclusion

Conventional thinking leads many to believe that a student's grades in high school indicate his or her readiness to engage in the college application process. But upon a closer examination of the factors that prepare students to apply successfully to college,

clear gaps in knowledge and information about admission requirements, institutional differences, and college costs persist across racial, socio-economic, and academic achievement groups (Conley, 2008) and, according to this pilot study, gender. In undertaking this study, I set out to create a survey instrument that would help school counselors better understand and measure some of the factors that promote college application readiness. By closely following Gehlbach and Brinkworth (2011)'s 6-step survey scale design process, I determined that the final reduced version of the CARS met the criteria for content and construct validity, but did not demonstrate robust internal consistency.

Based on the initial results of this pilot study, I believe additional analyses are worthwhile. In particular, I think *college fit knowledge* and *college application social capital* are two sub-domains extremely relevant to college application readiness and worthy of their own individual scales. Also, the interesting gender gap found within my sample, with females demonstrating more college application readiness than males, supports the need for future research looking more closely at the gender gap in educational attainment in the U.S. In particular, I was fascinated by the question of why Black, Hispanic, and white females are exhibiting more college application readiness than their male counterparts, while Asian females do not. Through future study, I hope to determine the underlying processes by which male and female students acquire college application readiness, including from whom this knowledge and information is derived and how much is needed to successfully complete this process. Ultimately, this study indicates that future research on these gender differences would promote increased persistence and college degree attainment for students of all backgrounds.

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Table 1. *Sample Demographic Characteristics of Counselors (n=13).*

Title	Organization Type	Gender	Race/Ethnicity
School counselor	High School	Female	White
School counselor	High School	Male	White
School counselor	High School	Female	White
School counselor	High School	Female	Hispanic
School counselor	High School	Male	White
School counselor	High School	Male	Black
School counselor	High School	Female	White
School counselor	High School	Male	White
Access Program Director	Non-profit	Female	White
College Adviser	Charter School	Female	Hispanic
College Counselor	Charter School	Male	White
College Counselor	For-Profit Company	Female	White
College Counselor	Charter School	Female	White

Table 2. *Sample Demographic Characteristics of Student Focus Group Participants (n=24).*

Age	Gender	Race	Home Language	Free/Reduced Lunch Eligible	Parents' Education
14	Female	Black	Haitian-Creole	Yes	Grad. Sch.
15	Female	Black	Arabic	Yes	2-year coll.
15	Female	Black	Haitian-Creole	Yes	High Sch.
15	Male	Arabic	Arabic	Yes	Grad. Sch.
16	Female	Black	Arabic	Yes	2-year coll.
16	Female	Black	Haitian-Creole	Yes	Unsure
16	Female	Hispanic	Spanish	Yes	4-year coll.
17	Male	Black	Haitian-Creole	Yes	Unsure
17	Female	Black	Amharic	Yes	Grad. Sch.
17	Female	Black	Haitian-Creole	Yes	High Sch.
17	Male	Black	English	No	Grad Sch.
17	Female	Black	Haitian-Creole	Yes	Unsure
17	Female	Black	Haitian-Creole	Yes	Unsure
17	Female	Black	[LEFT BLANK]	Yes	4-yr. coll.
18	Female	Black	Haitian-Creole	Yes	Grad. Sch.
18	Male	Asian	Bengali	Yes	Unsure
18	Female	Black	Haitian-Creole	Yes	Grade Sch.
18	Female	Black	Haitian-Creole	Yes	Grad. Sch.
18	Male	Black	Amharic	Yes	2-yr. coll.
18	Female	Black	Amharic	Yes	High Sch.
18	Male	White	English	No	Grad. Sch.
18	Female	Black	Haitian-Creole	Yes	Unsure
18	Female	Hispanic	Spanish	No	Grad. Sch.
18	Female	Black	[LEFT BLANK]	Yes	Grade Sch.

Note. Parents' Level of Education refers to the highest level of education listed for either parent.

Table 3. *Sample Demographic and Professional Characteristics of Expert Reviewers (n=14).*

Expertise Type	Title	Affiliation Type	Gender
Academic	Assistant Professor	University	Female
Academic	Associate Professor	University	Female
Academic	Associate Professor	University	Female
Academic	Associate Professor	University	Male
Academic	Doctoral Student	University	Female
Academic	Doctoral Student	University	Female
Academic/Practitioner	Lecturer	University	Female
Academic/Practitioner	Senior Lecturer	University	Female
Practitioner	Dir. of College Counseling	For-Profit Org.	Female
Practitioner	Dir. of College Counseling	Charter School	Female
Practitioner	Dir. of College Counseling	Charter School	Female
Practitioner	Dir. of College Counseling	Private School	Female
Practitioner	Dir. of College Counseling	Charter School	Male
Practitioner	Access Program Director	Non-Profit Org.	Female
Practitioner	Dir. of College Counseling	Charter School	Female

Table 4. *Sample Demographic Characteristics of Cognitive Interview Participants (n=10).*

Age	Gender	Race	Home Language	Free/Reduced Lunch Eligible	Parents' Education
15	Male	White	English	No	Grad. Sch.
15	Female	Black	[LEFT BLANK]	No	Grad. Sch.
15	Male	Black	English	Yes	High Sch.
15	Male	Black	Haitian-Creole	Yes	Grad. Sch.
16	Female	Black	English	No	4-year coll.
17	Female	White	English	No	Grad. Sch.
17	Female	White	Turkish	No	Grad. Sch.
17	Female	Black	Cape Verde Creole	Yes	Unsure
18	Female	White	English	No	Grad. Sch.
18	Female	White	Algerian	No	4-year coll.

Note. Parents' Level of Education refers to the highest level of education listed for either parent.

Table 5. *Sample Demographic Characteristics of the Pilot Testing Student Participants (n=203).*

Demographic	Characteristic	Percent
Sex	Female	52%
Grade	Grade 9	18%
	Grade 10	26%
	Grade 11	25%
	Grade 12	31%
Race	Asian	13%
	Black	29%
	Hispanic/Latino	7%
	Native Hawaiian/Pacific Islander	1%
	White	36%
	Multiracial	13%
	Other	1%
Parent 1 Country of Origin	U.S.	46%
	Haiti	13%
	Other	41%
Speaks Non-English Language at Home	Yes	55%
Non-English Language Spoken at Home	Amharic	6%
	Arabic	7%
	Chinese	6%
	French	7%
	Haitian-Creole	19%
	Portuguese	7%
	Spanish	21%
	Other	25%
Past or Present Enrollment in ESL	Yes	14%
Free/Reduced Lunch Recipient	Yes	51%
Parent 1 Highest Level of Education	Not Sure	9%
	Grade School	2%
	High School	17%
	Vocational School	2%
	Some College	9%
	2-year College Degree	2%
	4-year College Degree	23%
	Graduate School Degree	36%
Parent 2 Highest Level of Education	Not Sure	21%
	Grade School	2%
	High School	17%
	Vocational School	2%
	Some College	9%
	2-year College Degree	5%
	4-year College Degree	20%
	Graduate School Degree	24%

Table 6. *Synthesized List of Indicators.*

College Application Readiness Indicators			
From Academic Literature Review	From Focus Groups and Interview		
	Counselors	Students	Synthesized List
Gathering information; specific career aspirations identified; individual-institution fit perspectives	Match and fit: students need to identify the 2-3 most important factors; lack of knowledge of the range of institution types (private vs. public); focus on fit over prestige	School size, location, faculty/student ratio, majors most important factors	Match and fit perspectives
Developing list of colleges; knowledge of academic admission requirements	Admissability; understanding how to build a college list; students don't have experience researching colleges	Building out college list (safety, match, reach schools); you can be looking for schools forever	Understanding of admissions requirements; crafting college list
Parent knowledge of college entrance requirements; Parents' highest level of education	Family a primary source of information; managing parent expectations	Parent knowledge of application process	Parent level of education, college knowledge, expectations
College cost, financial aid/affordability awareness	Affordability; debt aversion; need to ensure there are affordable schools on their college lists; price sensitive students have to worry more about financial fit (fewer schools for less competitive applicants)	Anxiety surrounding affordability, costs; focus on "full ride"; debt aversion; good grades = scholarship \$; students appealing their financial aid awards	Cost awareness; debt aversion
Parent knowledge of financial aid process	Have they filled out the FAFSA Forecaster online? Looked at Net Price Calculator on college websites? Some parents scared about costs; some reticent to share info	Parent knowledge varies; some parents not helpful; just provide their info; other parents familiar with FAFSA and Profile	Parents' understanding of financial aid, proactivity, and communication with student
Family financial resources	Financial literacy (the difference between grants, scholarships, loans; sticker vs. actual cost); parents who have figured out what aid they are eligible for and what they can afford; college savings	Parents not able to pay for college; parents can't help co-sign loans	Parents' and students' financial literacy and clarity with students on what they can help pay for
Students' relationship with school counselor	Counselors stretched too thing due to time and large caseloads = difficult to build strong relationships	GC too busy, too many students; one-size-fits all approach; GC has more experience/knowledge than parents, friends; GC just sends out your materials; GC focuses too much on safety schools, but that's their job	Personalized approach by GC

Students' relationship with peers planning to attend college; formal and informal communication networks	Students get info through word-of-mouth; from friends in college; not necessarily most accurate info	Asking a peer who's going through the process; asking a friend who is already in college for help	Network of friends in college
Working with an adult after school/participation in outside college counseling program	Having a mentor really helps, teacher allies	Working with a mentor, joining college prep program, family friend	Affiliation with college prep program, mentor, teacher, family friend
HEI location and proximity to students and marketing efforts; Knowledge of nearby public colleges	Challenge of undermatching; students only apply in-state because they think it's the most affordable option; counselors push students to apply to affordable in-state schools; non-profits push for more selective institutions	Desire to stay in-state; knowledge of local colleges that are also affordable (CCs); unclear about difference between public and private colleges (BC, BU, MIT sound like public colleges); community college stigma	Knowledge of difference between private and public colleges
Campus visits	Campus visits (at least one)	Visits to local colleges	# campus visits
SAT/ACT prep activities	SAT registration, preparation, class, finished exam	Working with tutor, taking practice tests on collegeboard.com	SAT/ACT prep activities
Essay writing	Essay pre-work: brainstorming/identifying topics, developing a personal narrative, writing drafts; essay drafted before start of senior year	Anxiety, lack of support for essay writing; especially difficult for immigrant students; lack of good feedback from GC	Essay writing activities/progress
Motivation, orientation, expectations towards college attendance; school ethos of enabling students	Decision-making; self-advocating; students don't always follow-through, won't apply for scholarships; missing key deadlines; need to develop a growth mindset	General feelings of unpreparedness, unequipped with life skills; feeling helpless	College aspirations, sense of agency

Table 7. *Pearson Correlations of the Sub-Scale Composites (n=203).*

Items	Mean	Std. Dev.	Pearson Correlations			
			Comp1	Comp2	Comp3	Comp4
Comp1. College Aspirations	2.37	0.69	1.000			
Comp2. College Fit Knowledge	2.65	0.62	0.229*	1.000		
Comp3. College Cost & Fam. Resources Aware.	1.81	0.50	0.438***	0.189*	1.000	
Comp4. College App. Social Cap.	2.41	0.60	0.324**	0.264**	0.317**	1.000

* $p < .10$ ** $p < .01$ *** $p < .001$

Table 8. *Parameter estimates, p-values, and associated goodness-of-fit statistics for hypothesized CFA model that failed to identify a single factor of college application readiness (n=203).*

	Hypothesized Model
Estimated Factor Loadings:	
<i>AccRate</i>	1.263
<i>AdHelp</i>	2.834~
<i>AppSteps</i>	2.622~
<i>CampType</i>	2.152~
<i>CarSure</i>	1.000
<i>Conf</i>	1.308~
<i>CostTalk</i>	2.071~
<i>DebtRate</i>	1.097
<i>FamHelp</i>	0.250
<i>FourYr</i>	1.233
<i>Friends</i>	1.300
<i>GradRate</i>	1.203
<i>ParHelp</i>	1.203~
<i>ParPay</i>	1.445~
<i>ParTalk</i>	1.150
Goodness-of-Fit Statistics:	
χ^2 statistic	188.78
<i>p</i> -value	<0.001
Key: ~ <i>p</i> <0.10; * <i>p</i> <0.05; ** <i>p</i> <0.01; *** <i>p</i> <0.001	

Table 9. *Parameter estimates, p-values, and associated goodness-of-fit statistics for hypothesized and reduced CFA models describing latent construct for new CARS subscale (n=203).*

	Hypothesized Model	Reduced Model
Estimated Factor Loadings:		
<i>AdHelp</i>	2.212**	2.361**
<i>AppSteps</i>	2.211**	1.928**
<i>CampType</i>	1.642*	1.634**
<i>CostTalk</i>	1.703*	1.788**
<i>FourYr</i>	1.000*	1.000*
<i>ParPay</i>	1.328*	1.028*
<i>Conf</i>	1.191*	
<i>FamHelp</i>	0.116	
<i>Friends</i>	1.168*	
<i>ParHelp</i>	0.944~	
<i>ParTalk</i>	0.888~	
Goodness-of-Fit Statistics:		
χ^2 statistic	73.313	14.033
p-value	0.0036	0.121

Key: ~ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 10. *Descriptive statistics and question text for the six items in the reduced final model of the CARS (n=203).*

Variable	Question Text	Mean	Std. Dev.
<i>AdHelp</i>	How often do you talk with an adult to get advice on the college application process?	2.280	1.120
<i>AppSteps</i>	What steps have you taken to learn more about the college application process?	2.191	1.493
<i>CampType</i>	How much thought have you given to the type of college campus setting you would be most comfortable?	2.95	1.095
<i>CostTalk</i>	How often do you have a serious talk about college costs with your parents(s)/guardian(s)?	2.587	1.246
<i>FourYr</i>	How interested are you in attending a 4-year college or university?	4.305	1.003
<i>ParPay</i>	How well do you understand your parents'/guardians' ability to pay for your college education?	3.490	1.193

Table 11. *Matrix of Pearson Correlations for the Six Items in the Final Reduced CARS Subscale and Participants' Self-reported Grade Level, GPA, Parents' Level of Education, and Absentee Rate (n=203).*

Variable	<i>FinalScale</i>	<i>Grade</i>	<i>GPA</i>	<i>ParentEdu</i>	<i>Absent</i>
<i>FinalScale</i>	1.000				
<i>Grade</i>	0.241*	1.000			
<i>GPA</i>	0.263*	0.046	1.000		
<i>ParentEdu</i>	0.143	0.306**	0.406***	1.000	
<i>Absent</i>	-0.197~	0.075	0.316**	0.220*	1.000

Key: ~p<0.10; *p<0.05; **p<0.01; ***p<0.001

Table 12. *Mean Scores on the CARS of the Pilot Testing Student Participants by Demographics*

Demographic	Characteristic	Mean	Std. Dev.
Sex	Female	3.11	4.16
	Male	2.66	4.10
Race	Asian	2.78	2.71
	Black	2.98	5.71
	Hispanic/Latino	2.47	4.31
	White	2.80	4.18
	Multiracial	3.02	4.11
Free/Reduced Lunch Recipient	Yes	2.88	4.29
	No	2.85	4.06
Parent Highest Level of Education	Not Sure	2.54	4.29
	High School	3.12	6.41
	Some College	2.61	3.90
	4-year College Degree	2.94	4.32
	Graduate School Degree	3.02	3.80

Table 13. *Mean Scores on the CARS of the Pilot Testing Student Participants, Demographic Differences by Gender*

Demographic Characteristic	Male	Female	Diff in means	t	Significance (1-tailed)
Asian	2.77	2.78	0.01	-0.06	0.47
Black	2.69	3.46	0.77	-1.91	0.04*
Hispanic/Latino	2.13	3.17	1.04	-2.26	0.04*
White	2.56	3.09	0.53	-2.29	0.02*
Multiracial	3.00	3.03	0.03	-0.09	0.46
Free/Reduced Lunch Eligible	2.60	3.16	0.56	-2.37	0.01*
Free/Reduced Lunch Ineligible	2.68	3.06	0.38	-1.92	0.03*
Parent Edu/ Not Sure	2.29	3.42	1.13	-2.57	0.02*
Parent Edu/ High School	3.37	2.87	-0.50	0.72	0.75
Parent Edu/ Some College	2.35	2.93	0.58	-1.91	0.04*
Parent Edu/ 4-year College	2.58	3.37	0.79	-2.07	0.03*
Parent Edu/ Graduate School	2.83	3.20	0.37	-1.85	0.04*

* $p < .05$